

04-R-313, Molecular Foundry
Lawrence Berkeley National Laboratory, Berkeley, California

(Changes from the FY 2005 Congressional Budget Request denoted with a vertical line in the left margin)

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost (\$000)	Total Project Cost (\$000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2004 Budget Request (<i>Preliminary Estimate</i>)	3Q 2002	1Q 2004	2Q 2004	2Q 2006	83,700	85,000
FY 2005 Budget Request (<i>Performance Baseline</i>)	3Q 2002	1Q 2004	2Q 2004	1Q 2007	83,700	85,000
FY 2006 Budget Request.....	3Q 2002	1Q 2004	2Q 2004	1Q 2007	83,700	85,000

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
Project Engineering And Design (PED)			
2002	500	500	38
2003	6,715 ^a	6,715 ^a	5,263
2004	0	0	1,896
2005	0	0	18
Construction			
2004	34,794 ^b	34,794 ^b	11,583
2005	31,828 ^{ac}	31,828 ^{ac}	34,013
2006	9,606 ^b	9,606 ^b	29,052
2007	257 ^c	257 ^c	1,837

^a PED funding was reduced by \$85,000 as a result of the FY 2003 general reduction and rescission. This total reduction/rescission was restored in the FY 2005 request to maintain the TEC and project scope.

^b Construction funding was reduced by \$207,000 as a result of the FY 2004 rescission. This reduction is restored in the FY 2006 request to maintain the TEC and project scope.

^c Construction funding was reduced by \$257,000 as a result of the FY 2005 rescission. This reduction is restored in the FY 2007 request to maintain the TEC and project scope.

3. Project Description, Justification and Scope

The proposed Molecular Foundry at LBNL will be a new structure near the National Center for Electron Microscopy. The project includes an approximately 89,000 gross square foot research building, a separate approximately 6,000 gross square foot utility center, and an initial set of special equipment to support nanoscale scientific research. The research building will be an advanced facility with state-of-the-art clean rooms for the design, modeling, synthesis, processing, fabrication and characterization of novel molecules and nanoscale materials. Space in the new facility will support studies in nanostructures by providing offices and laboratories for materials science, physics, chemistry, biology, and molecular biology. These laboratories, equipped with advanced instrumentation and staffed by full-time, dedicated staff scientists and technicians, will be user facilities, available to scientists from universities, industry, and government laboratories whose research proposals will have been peer reviewed by a Proposal Study Panel. This combination of advanced equipment, collaborative staff, and breadth across disciplines will allow users to explore the frontiers of nanoscience.

The goals and operation of the Molecular Foundry are consistent with DOE guidance and address the research challenges described in the reports *Nanoscale Science, Engineering and Technology Research Directions* and *Complex Systems: Science for the 21st Century*. The Foundry's laboratories will be designed and constructed to facilitate collocation of research activities in a wide variety of fields, as required for progress in this new area of science. The Foundry will support a broad research effort focusing on both "hard" nanomaterials (nanocrystals, tubes, and lithographically patterned structures) and "soft" nanometer-sized materials (polymers, dendrimers, DNA, proteins, and whole cells), as well as design, fabrication, and study of multi-component, complex, functional assemblies of such materials.

By functioning as a "portal" to Lawrence Berkeley National Laboratory's established major user facilities, the Foundry will also leverage existing nanoscience research capabilities at the Advanced Light Source, the National Center for Electron Microscopy, and the National Energy Research Scientific Computing Center. The research program will, as an additional benefit, provide significant educational and training opportunities for students and postdoctoral fellows as the "first true generation" of nanoscientists.

FY 2004 funding is being used to initiate construction to complete site preparation, and for equipment procurement. FY 2005 and FY 2006 funding will be used to continue conventional construction and equipment procurement.

4. Details of Cost Estimate^a

(dollars in thousands)		
	Current Estimate	Previous Estimate
Design Phase		
Preliminary Design & Final Design	5,010	4,877
Design Management costs (2.6% of TEC)	2,205	1,570
Total, Design Costs (8.6% of TEC)	7,215	6,447
Construction Phase		
Building & Improvements to land	49,444	47,450
Special Equipment ^b	15,056	15,000
Inspection, design and project liaison, check out	2,057	2,446
Construction Management & Project Management (2.2% of TEC)	1,806	2,106
Total, Construction Costs	68,363	67,002
Contingencies		
Design Phase (0.0% of TEC)	0	768
Construction Phase (9.7% of TEC)	8,122	9,483
Total, Contingencies (9.7% of TEC)	8,122	10,251
Total, Line Item Costs (TEC)	83,700	83,700

5. Method of Performance

An Architect Engineering firm (AE) with appropriate multi-disciplinary design experience has prepared a building program and design criteria with the support of the LBNL Facilities Department. The AE also prepared Title I and II design and is providing technical oversight during Title III construction. A Construction Management (CM) contractor performed cost, schedule, and constructability reviews during design. Selection of the CM contractor during the design phases was based on competitive bidding of the Construction General Conditions. The CM contract has an option for management of the construction process. At the completion of design, the CM contractor bid out the design to subcontractors. The University has exercised its option to proceed with the CM contractor. Construction subcontract(s) are awarded on a competitive basis using best value source selection criteria that include price, safety, and other considerations.

^a This cost estimate is based on Title II design. The annual escalation rates assumed in the FY 2004 estimate for FY 2003 through FY 2007, are 2.1%, 2.5%, 2.9%, 2.8% and 2.6% respectively.

^b Initial research equipment.

6. Schedule of Project Funding

(dollars in thousands)

Prior Years	FY 2004	FY 2005	FY 2006	Outyears	Total
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Facility Cost

PED	5,301	1,896	18	0	0	7,215
Construction	0	11,583	34,013	29,052	1,837	76,485
Total, Line Item TEC.....	5,301	13,479	34,031	29,052	1,837	83,700

Other Project Costs

Conceptual design cost.....	730	0	0	0	0	730
NEPA Documentation Costs	40	0	0	0	0	40
Other project-related costs ^a	162	0	0	368	0	530
Total, Other Project Costs	932	0	0	368	0	1,300
Total, Project Costs (TPC).....	6,233	13,479	34,031	29,420	1,837	85,000

7. Related Annual Funding Requirements

(FY 2007 dollars in thousands)

Current Estimate	Previous Estimate
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Annual facility operating costs	18,500	18,000
Total related annual funding	18,500	18,000

^a Includes tasks such as safety documentation, ES&H monitoring, operations and maintenance support, readiness assessment, and preoperational start-up. Experimental research will begin at the time of beneficial occupancy of the facility. These research costs are not part of the TPC and will be funded by the BES program.